SUPPLEMENTARY TABLES

Table 1: Previous data for the southern supersegment : major elements (Vlastélic et al., 2000) and segment number.

	SiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	Total	Segment
PAC1 CV1	49.78	15.70	9.79	0.18	8.45	11.71	2.49	0.04	1.10	99.24	1
PAC1 CV2	50.78	14.37	10.49	0.19	7.74	11.25	2.55	0.06	1.67	99.10	1
PAC1 CV3	50.70	15.53	8.60	0.16	8.57	11.91	2.53	0.08	1.20	99.28	1
PAC1 CV4	50.30	15.46	8.55	0.16	8.78	12.32	2.46	0.04	1.05	99.12	1
PAC1 CV6	50.44	15.37	9.31	0.17	8.51	12.01	2.50	0.04	1.23	99.58	1
PAC1 CV7	51.06	14.50	9.80	0.19	7.88	12.03	2.71	0.04	1.31	99.52	1
PAC1 DR3	51.18	14.51	9.88	0.18	7.30	11.21	3.00	0.15	1.59	99.00	2
PAC1 DR4	49.13	15.71	10.08	0.18	7.25	11.83	2.87	0.12	1.35	98.52	3
PAC1 DR5-1	51.00	15.45	8.42	0.15	8.33	12.01	2.82	0.09	1.19	99.46	4
PAC1 DR6	50.99	13.99	11.20	0.20	6.93	10.58	2.86	0.12	2.02	98.89	4
PAC1 DR7-1	50.75	14.43	10.70	0.22	6.83	10.58	3.03	0.19	1.94	98.67	4
PAC1 DR7-2	50.83	14.43	10.52	0.18	7.35	11.29	2.91	0.12	1.69	99.32	4
PAC1 DR9	50.75	13.42	12.15	0.22	6.36	10.44	3.09	0.12	2.20	98.75	5
PAC1 DR10-1	53.79	14.10	10.77	0.21	4.83	8.59	3.43	0.48	1.73	97.93	5
PAC1 DR10-2	51.46	14.10	10.87	0.20	6.22	10.36	3.37	0.25	1.75	98.58	5
PAC1 DR11-1	50.21	14.32	9.25	0.17	7.33	11.34	2.70	0.06	1.31	96.69	6
PAC1 DR12-1	50.94	15.62	8.49	0.15	8.85	12.31	2.32	0.03	1.03	99.74	6
PAC1 DR13-1	50.37	14.60	10.89	0.18	7.38	10.76	2.82	0.09	1.64	98.73	6
PAC1 DR13-2	50.50	14.52	11.01	0.19	7.42	10.73	2.85	0.09	1.65	98.96	6

Table 2: Previous data for the northern supersegment : major elements (Hamelin et al., 2010) and segment names.

	SiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	Total	Segment
PAC2 DR 1-1	50.20	14.60	10.75	0.18	7.30	11.90	2.82	0.20	1.58	99.53	S1
PAC2 DR3-1											S1
PAC2 DR4-2	50.40	14.28	11.70	0.20	7.08	11.20	2.83	0.12	1.79	99.60	S1
PAC2 DR5-2	49.90	13.65	13.45	0.22	6.52	10.40	2.74	0.18	2.13	99.19	S2
PAC2 DR6-6	51.30	12.56	15.70	0.26	4.34	8.66	3.46	0.31	2.88	99.47	S2
PAC2 DR7-2											S3
PAC2 DR8-1	49.40	14.40	12.65	0.20	7.05	11.70	2.87	0.20	1.66	100.13	S3
PAC2 DR20-1	51.15	13.90	14.20	0.24	4.60	9.35	3.34	0.25	2.40	99.43	N1
PAC2 DR21-2	50.30	13.88	12.50	0.21	6.73	11.10	2.79	0.15	2.00	99.66	N1
PAC2 DR22-1	49.90	14.60	11.70	0.20	7.25	11.60	2.78	0.17	1.87	100.07	N1
PAC2 DR28-2	49.70	15.00	11.15	0.19	7.85	12.10	2.52	0.08	1.39	99.98	N3
PAC2 DR29-1	49.90	13.37	13.80	0.23	6.16	10.75	2.83	0.19	2.31	99.54	N3
PAC2 DR30-1	50.00	14.05	12.45	0.21	7.00	11.70	2.64	0.17	1.94	100.16	N3
PAC2 DR31-3	49.85	14.70	11.70	0.19	7.55	11.45	2.56	0.10	1.74	99.83	N3
PAC2 DR32-1	50.50	14.00	12.60	0.21	6.80	11.10	2.84	0.16	2.02	100.23	N4
PAC2 DR33-1	50.20	13.90	12.80	0.21	6.63	10.95	2.84	0.15	2.10	99.78	N4
PAC2 DR34-1	50.00	15.10	10.44	0.18	8.00	12.08	2.60	0.06	1.30	99.76	N4
PAC2 DR35-1a	49.50	13.15	15.05	0.23	5.65	9.93	3.05	0.17	2.93	99.66	N5
PAC2 DR36-1	49.60	14.25	12.50	0.20	7.07	11.30	2.80	0.15	2.09	99.96	N5
PAC2 DR37-2											N5
PAC2 DR38-1	49.10	15.7	10.80	0.18	8.35	11.70	2.67	0.09	1.42	99.72	N6

Table 3: Data table for the southern supersegment : K_2O, La and Sm content from Vlastélic et al. (2000); H_2O, Cl, Ce and δD from this study.

	Long. (°W)	Lat. (°S)	Depth (m)	H_2O (ppm)	δD (‰)	Cl (ppm)	Ce (ppm)	H_2O/Ce	$(La/Sm)_N$	Cl/K
PAC1 CV1	173.75	-65.10	2863	1192	-63.2	56	5.6	213	0.49	0.169
PAC1 CV2	172.43	-64.83	2936	2070	-60.5	61	10.5	197	0.47	0.122
PAC1 CV3	171.88	-64.53	2576	2217	-54.5	55	8.7	255	0.64	0.083
PAC1 CV4	169.40	-64.40	2340	844	-76.6	52	6.3	134	0.49	0.157
PAC1 CV6	166.06	-63.45	2755	1030	-65.7	53	5.2	198	0.44	0.160
PAC1 CV7	165.96	-63.54	1603	1182	-69.5	218	10.5	113	0.85	0.656
PAC1 DR3	156.08	-62.32	2219	2672	-66.4	175	14.8	181	0.84	0.140
PAC1 DR4	153.04	-62.41	1587	2151	-66.5	29	10.7	201	0.65	0.029
PAC1 DR5-1	154.54	-62	2344	1585	-61.3	43	10.2	155	0.77	0.058
PAC1 DR6	153.21	-60.94	2527	2705	-71.7	39	14.6	185	0.61	0.039
PAC1 DR7-1	152.08	-60	2362	3112	-60.8	533	17.9	174	0.76	0.338
PAC1 DR7-2	152.08	-60	2362	2437	-66.0	206	13.1	186	0.63	0.207
PAC1 DR9	149.14	-58.85	2484	2956	-65.2	380	15.9	186	0.56	0.381
PAC1 DR10-1	148.50	-57.89	2319	7808	-58.1	2395	39.6	197	0.94	0.601
PAC1 DR10-2	148.50	-57.89	2319	3835	-57.7	1008	23.1	166	0.80	0.485
PAC1 DR11-1	146.80	-57.63	2500	1889	-48.7	162	9.6	197	0.56	0.325
PAC1 DR12-1	146.29	-57.18	2539	1175	-69.0	48	6.0	196	0.45	0.193
PAC1 DR13-1	145.74	-56.57	2674	2112	-56.1	76	11.7	181	0.54	0.102
PAC1 DR13-2	145.74	-56.57	2674	2345	-65.4	66	11.1	211	0.61	0.088

Table 4: Data table for the northern supersegment. K_2O, La, Sm and Ce from Hamelin et al. (2010); H_2O. Cl and δD from this study.

	Long. (°W)	Lat. (°S)	Depth (m)	H_2O (ppm)	δD (‰)	Cl (ppm)	Ce (ppm)	H_2O/Ce	$(La/Sm)_N$	Cl/K
PAC2 DR 1-1	118.4	-52.52	2323	2397	-60.1	256	14.4	166.47	0.78556	0.154
PAC2 DR3-1	118.0	-51.79	2396	2783	-59.8	309	13.6	205.21		
PAC2 DR4-2	117.8	-51.42	2409	2310	-64.8	257	12.8	180.67	0.60379	0.258
PAC2 DR5-2g	117.4	-50.98	2784	3296	-60.9	309	17.6	186.92	0.81617	0.207
PAC2 DR6-6	117.2	-50.70	2610	6546	-51.2	78	39.0	168.01	0.86064	0.030
PAC2 DR7-2g	117.1	-50.24	2229	2764	-58.4	479				
PAC2 DR8-1	117.0	-49.99	2220	3012	-51.8	271	15.8	190.61	0.90177	0.163
PAC2 DR20-1	113.8	-49.73	2440	4797	-55.2	1631	34.2	140.34	0.80392	0.786
PAC2 DR21-2	113.6	-49.26	2338	2384	-56.2	308	14.0	170.82	0.65922	0.247
PAC2 DR22-1	113.4	-48.73	2413	2646	-56.6	348	14.6	180.83	0.60670	0.246
PAC2 DR28-2	113.3	-47.51	2488	1656	-56.2	1397	8.6	191.77	0.57468	2.103
PAC2 DR29-1	113.1	-47.01	2407	2933	-68.2	439	17.1	171.94	0.68383	0.278
PAC2 DR30-1	112.9	-46.40	2345	2446	-60.1	385	14.9	164.14	0.66544	0.273
PAC2 DR31-3	112.7	-45.85	2414	1983	-65.5	530	12.7	156.74	0.61245	0.672
PAC2 DR32-1	112.4	-45.39	2384	2695	-61.0	356	16.2	166.78	0.69091	0.268
PAC2 DR33-1	112.3	-44.87	2374	2657	-56.8	294	16.2	164.05	0.70567	0.236
PAC2 DR34-1	112.0	-44.24	2467	1276	-61.4	1516	8.1	158.20	0.46939	3.042
PAC2 DR35-1a	111.8	-43.59	2463	4808	-51.7	259	24.9	192.85		0.183
PAC2 DR36-1	111.6	-42.95	2503	2804	-55.6	548	16.2	173.59	0.64663	0.440
PAC2 DR37-2	111.3	-42.27	2474	2462	-58.2	439	15.1	163.35		
PAC2 DR38-1	113.3	-41.8	2524	1751	-57.8	151	10.2	172.343		0.214

Table 5: Data table for both supersegment : isotopes ratos from Vlastélic et al. (2000); Hamelin et al. (2011).

	$^{87}Sr/86Sr$	$^{143}Nd/^{144}Nd$	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{204}Pb$	$^{208}Pb/^{204}Pb$	$^{176}Hf/^{177}Hf$	R/R_a
PAC1 CV1	0.702597	0.513124	18.761	15.591	38.549	0.283144	
PAC1 CV2	0.702568	0.513135	18.391	15.485	37.868	0.283175	7.6
PAC1 CV3	0.702406	0.513117	18.492	15.486	37.923	0.28317	
PAC1 CV4	0.702512	0.513144	18.157	15.462	37.575	0.283173	8.1
PAC1 CV6	0.702397	0.513129	18.35	15.476	37.804	0.283172	
PAC1 CV7	0.702778	0.513002	18.558	15.578	38.376		
PAC1 DR3							
PAC1 DR4	0.702649	0.513091	18.716	15.608	38.63		
PAC1 DR5-1	0.702407	0.513132	18.489	15.495	37.926	0.283168	
PAC1 DR6	0.702502	0.513126	18.498	15.491	37.911	0.283163	8
PAC1 DR7-1	0.702472	0.513099	18.609	15.505	38.039	0.283144	
PAC1 DR7-2	0.702454	0.513098	18.62	15.509	38.062	0.283129	
PAC1 DR9	0.702467	0.51312	18.638	15.511	38.075	0.28315	
PAC1 DR10-1	0.702473	0.513112	18.426	15.492	37.881	0.283149	
PAC1 DR10-2							
PAC1 DR11-1	0.702435	0.513125	18.42	15.491	37.877	0.283171	
PAC1 DR12-1	0.70231	0.51315	18.064	15.467	37.468	0.283235	
PAC1 DR13-1							
PAC1 DR13-2	0.702556	0.513142	18.508	15.503	37.954	0.283204	7.6
PAC2 DR1-1	0.702422	0.51309	18.822	15.547	38.199	0.283133	7.6
PAC2 DR3-1							
PAC2 DR4-2	0.702367	0.513134	18.531	15.513	37.942	0.283163	7.7
PAC2 DR5-2g	0.702524	0.513098	18.674	15.537	38.11	0.283135	7.5
PAC2 DR6-6	0.702396	0.513099	18.696	15.537	38.123	0.283143	
PAC2 DR7-2g							
PAC2 DR8-1	0.702483	0.513077	18.796	15.55	38.237	0.283132	7.3
PAC2 DR20-1	0.702493	0.513092	18.749	15.54	38.168	0.283126	7.1
PAC2 DR21-2	0.702483	0.513088	18.768	15.544	38.189	0.283125	7.1
PAC2 DR22-1	0.702465	0.5131	18.726	15.539	38.153	0.283131	7.25
PAC2 DR28-2	0.702468	0.51307	18.725	15.539	38.121	0.283102	7.1
PAC2 DR29-1	0.702504	0.513059	18.798	15.538	38.208	0.283117	7.2
PAC2 DR30-1	0.702472	0.51306	18.887	15.565	38.311	0.283106	6.8
PAC2 DR31-3	0.702479	0.513066	18.833	15.554	38.242	0.283112	7.3
PAC2 DR32-1	0.702516	0.513078	18.809	15.539	38.202	0.2831	7.2
PAC2 DR33-1	0.702488	0.513082	18.817	15.562	38.236	0.283111	7.26
PAC2 DR34-1	0.702392	0.513108	18.798	15.549	38.234	0.283145	7.3
PAC2 DR35-1a						0.283121	7.2
PAC2 DR36-1	0.702479	0.513066	18.724	15.538	38.117	0.283119	7.5
PAC2 DR37-2						0.283118	7.3
PAC2 DR38-1	0.702465	0.513108	18.671	15.533	38.039	0.283125	7.2